

Comcast in Massachusetts: Delivering for Consumers and the Economy

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Comcast in Massachusetts

3,100,000

MA homes passed
by Gigabit service

\$679 million

Annual taxes, fees, and
permits paid or
collected for MA over
past 3 years

More than **5,000**
full time
employees

\$1.2 billion invested
in technology &
infrastructure in past 3
years

388,000 Low-income
Massachusetts residents
in **97,000** homes connected
to the internet through
Internet Essentials
since 2011.

Largest
US provider of
Gigabit Service
(60 million households)

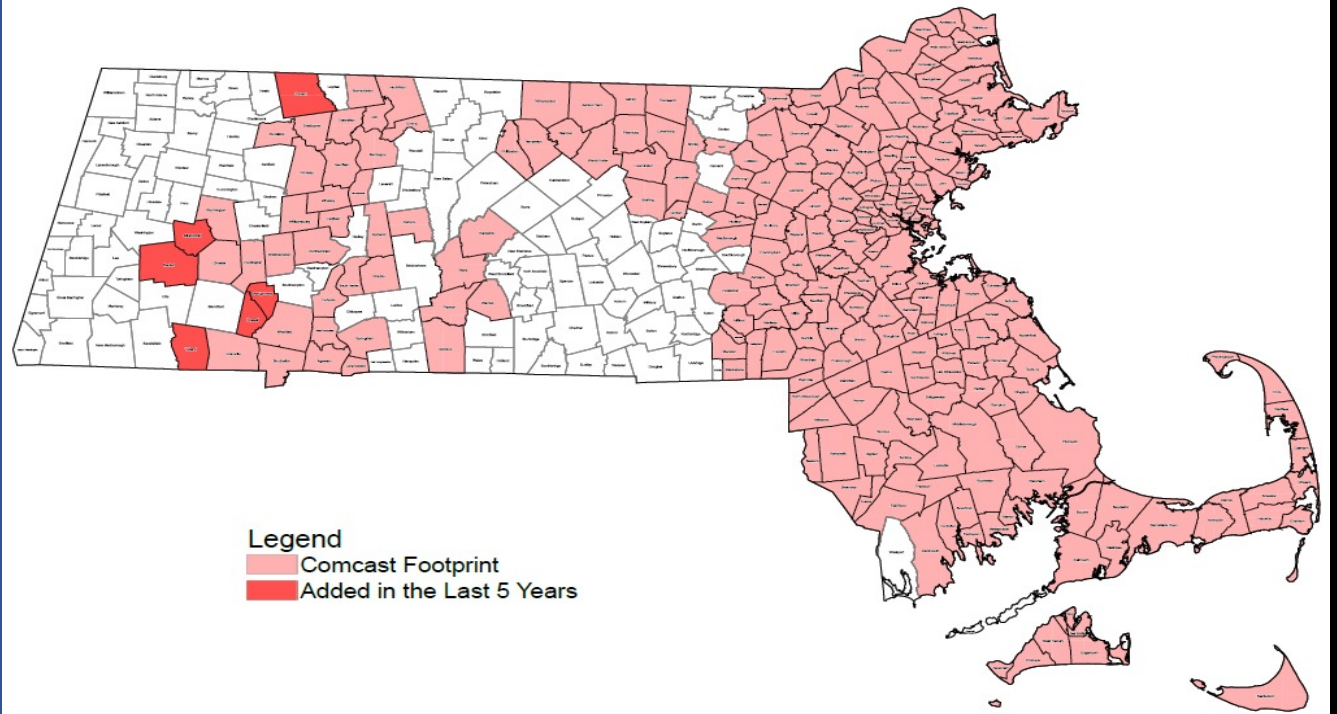
\$1.1 billion in
payroll, benefits &
workforce training
in MA over past 3
years

Committed to
Diversity, Equity
& Inclusion

Added in the last 5 years

Montgomery
Middlefield
Worthington
Tolland
Becket*
Colrain*
Russell

Comcast Footprint - Massachusetts



Meeting the Pandemic Challenge

TRAFFIC

2020 was historic. In the span of 4 months in the wake of pandemic lockdowns, Comcast's network experienced almost 2 years worth of traffic growth.

↑ 20-80%

Increase in **gaming downloads**, depending on new releases.

↑ 20-40%

Increase in **video streaming**.

14x

Despite the growth in upstream traffic, traffic patterns remained highly asymmetrical, as downstream traffic volumes were 14x higher than upstream traffic volumes throughout 2020.

1 trillion

For the first time ever, as Comcast customers surfed, streamed and emailed more than ever before, they generated more than a trillion Internet requests (DNS lookups) each day.

Peak downstream traffic increased approximately 38 percent over 2019 levels and peak upstream traffic increased approximately 56 percent. Peak Internet traffic rose 32 percent over pre-pandemic levels, and over 50 percent in some markets in March.

↑ 38%

Downstream

↑ 56%

Upstream

• 39,153 route miles of fiber

Added to the network from 2017-2020, and we've made thousands of capacity augments from the core of our network all the way down to individual neighborhoods.

• 30+ million

The number of high-speed Internet customers served by our network.

• 2x

We've doubled our network capacity every 2.5 years to stay well ahead of demand.

Comcast Network Infrastructure

Fiber Backbone

- 191,000 + route miles of fiber
- Using the industry's advanced optics/lasers and Internet Protocol ("IP") routing technologies
- Dozens of converged regional area networks interconnect
- IP technology ties all of this together, creating a highly scalable connectivity platform or "IP core."

Delivery Network

- Highly scalable hybrid fiber-coaxial ("HFC")
- Fiber-optic cables are constructed to the service area, i.e. serving node
- At node, optical signals are converted to electrical or radio frequency for distribution over the coaxial network to subscriber's homes and businesses
- 750,000 route miles of fiber-optic and coaxial plant nationwide
- Data Over Cable Service Interface Specification (DOCSIS) technology

Smart & Reliable

- 200M Comcast.net emails, delivered daily; 162 million spam emails blocked
- 700K+ Network diagnostic speed tests performed most days

Level Set: Digital Divide Definitions

Adoption

- Are consumers purchasing available broadband?
Why Not?

Access

- Is broadband available? Why not?

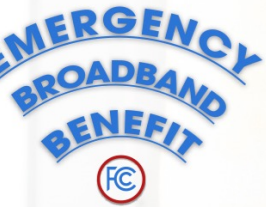
Deployment Challenges Premises Without Access



- **Geography\Topography:** low density, rural, underground construction, federally protected forest
- **Make Ready:** poles too short to accommodate attachments, replacements drive costs, process drives schedules
- **Private Property** Easements
- **Equity:** Line Extension Policy set out in cable regulations, franchise agreements
- **Identification\Mapping** – where are they?



internet» essentials



Adoption: Leading the Way

- Internet Essentials – Nation's largest and most comprehensive adoption program
 - **Connected 388,000 Massachusetts residents in 97,000 households since 2011**
- Internet Essentials Partnership Program (IEPP) – **33 IEPPs**
- Lift Zones – **58 Lift Zones (many in Gateway Communities)**
- Digital Equity Partnerships
- Emergency Broadband Benefit

Adoption: What We Are Still Learning

Three primary barriers to broadband adoption

- Cost
- Availability of a device
- Digital literacy

With many layers

- Language
- Literacy
- Population mobility
- Very low-income



Focus on the Unserved

- One-time opportunity to achieve near ubiquitous availability
- Every dollar spent on overbuilding networks is diverted from the unserved
- Collaboration is key – stakeholders must be involved
- Roles for Government
 - Identifying funding sources and potential partners
 - Determining areas in need
 - Establishing programs that encourage private investment
 - Educate on the value of broadband; create digital literacy programs; fund adoption programs



Questions?